

# WIPE FOR REMOVING STAINS FROM FABRICS AND CARPETS

## 5 BACKGROUND OF THE INVENTION

### 1. Field of the Invention

10 The present invention relates to wipes impregnated with  
a cleaning composition. More particularly, the present  
invention relates to a cleaning composition impregnated on a  
woven or non-woven wipe capable of removing stains from  
carpets, fabrics and other inanimate surfaces.

### 15 2. Description of the Prior Art

20 Fabric and carpet fibers may stain upon contact with  
water and proteinaceous materials, particulate matter,  
oily/greasy type soils, oxidizable materials, and numerous  
other materials. Such stains are conventionally removed by  
compositions containing combinations of cleansing  
surfactants that lift and remove the stains from the fabric.  
Stain removing compositions may also be formulated to  
25 further contain an array of enhancing agents including  
active oxygen-containing compounds, malodor reducing  
compounds, fragrances, skin softening and conditioning  
agents and anti-soiling agents, commonly referred to as soil  
resists that prevent or impede the re-soiling of the fabric  
30 after cleaning.

One type of soil resist, a fluorosurfactant, is described in U.S. Patent Nos. 5,712,240 and 5,728,669, both to Tyerech et al. Compositions for reducing malodor impressions are described in U.S. Patent No. 5,783,544 to 5 Trinh et al. and include perfumes, metal salts and cyclodextrins.

In addition to providing acceptable stain removal ability, stain removal compositions must be stable for long periods of time under different conditions, and should be convenient to use. A cleaning wipe may be stored by the ultimate consumer for many months before use, and done so under less than ideal conditions. During storage, the components of the composition cannot separate from each other, be subject to microbial growth, or lose efficacy. 15 The cleaning wipe must also prevent microbial growth that is inadvertently introduced during normal use in order to be acceptable to the consumer. This is accomplished with preservatives, which are disclosed in U.S. Patent No. 20 5,783,544 to Trinh et al.

To prevent microbial growth in a wipe, and be convenient and easy to use, a cleaning composition impregnated on a wipe must maintain wetness of the wipe 25 material to allow effective distribution of anti-bacterial

and mold inhibition agents, i.e., preservatives. Exposure of the entire wipe to the cleaning solution may be accomplished in a number of ways including: through wicking action of the cleaning solution, inversion of the wipe and solution package, submersion of the wipe in the cleaning solution package, top filling of the cleaning solution over the wipe material, spraying of the cleaning solution onto the wipe material, or any combinations thereof.

#### **SUMMARY OF THE INVENTION**

It is an object of the present invention to provide a cleaning wipe impregnated with a liquid cleaning composition.

It is another object of the present invention to provide such a cleaning wipe for use on fabric, carpet, and other inanimate surfaces.

It is yet another object of the present invention to provide a cleaning wipe in which the wipe's composition and integrity remain stable when stored in contact with the cleaning composition, where the wipe does not dry out during storage, and is resistant to microbial growth during both long and short term storage under a variety of conditions.

It is a further object of the present invention to provide a method for manufacture of such a cleaning wipe by pre-filling the wipe container with the cleaning composition prior to addition of the wipe material, without subsequent  
5 inversion of the package to wet the wipes, or top filling over the wipe material.

It is still a further object of the present invention to provide an article of manufacture comprising a cleaning  
10 composition impregnated on a wipe, and a suitable, re-sealable or single use container for dispensing the wipe.

These and other objects and advantages are achieved, in brief summary, by a cleaning wipe having a woven or non-  
15 woven wipe impregnated with a cleaning composition comprising a preservative system, a surfactant system and a carrier. The present invention may include one or more optional enhancing agents.

#### 20 **DETAILED DESCRIPTION OF THE INVENTION**

The present invention provides a cleaning composition impregnated into a wipe. Preferably, the cleaning  
25 composition has a preservative system, a surfactant system that includes one or more surfactants, and a carrier. Still further, the cleaning wipe may have one or more enhancing

agents including a fragrance, a malodor reducing system, skin softening and conditioning agent, a pH control agent, a peroxygen component, an alcohol, a soil resist, or any combinations thereof.

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As used in the present invention, the singular of a term includes the singular or plural of the term, unless otherwise indicated.

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The cleaning wipe provides superior cleaning and ease of use while maintaining chemical stability, resisting microbial growth, and maintaining cleaning solution distribution throughout the entire wipe during storage.

The cleaning wipe is disposable, and primarily used in a single use modality, being made available for use in a resealable or single use container. Suitable containers include, for example, a canister, tub, tray, flexible pouch, and packette. The flexible pouch may be, for example, resealable, be contained in an outer carton, may have a plastic lid, or any combinations thereof.

The cleaning wipe is stored impregnated with the cleaning composition in a ready to use fashion. The cleaning wipe may be used to clean fabric, carpet, and other

inanimate surfaces, such as, for example, a countertop, drawer, shelf, and metal fixture.

The wipe may be made of an absorbent or semi-absorbent material. It may be in the form of a woven, nonwoven, or partially woven sheet. It is preferable that the wipe, or wipe material be made of a substantially fibrous or semi-fibrous material. The material may be cotton, nylon, polyester, polyethylene, polypropylene, porous foam, rayon, reticulated foam, reticulated thermoplastic film, thermoplastic scrim, wood pulp, or any combinations thereof. The wipe may be single surfaced or in the alternative may incorporate a backing member.

The backing member may be pervious or impervious to the cleaning solution. The backing member may be manufactured from a wide range of materials such as woven or non-woven material, polymeric material, natural fiber, synthetic fiber, or any combinations thereof. The backing member may provide structural support to the wipe, impart texture to the wipe, provide a prophylactic barrier, or any combinations thereof.

The wipe material may be used alone or in combination with binders that include, but are not limited to, lignin,

starch, acrylic, vinyl acrylic, styrene-butadiene, and others known in the art. These binders may be used alone or in any combinations thereof.

5           The wipe may be formed from the wipe material by any process known to those skilled in the art. Such a process includes, but is not limited to carded/chemically or resin bonded, non-woven wipe carded/chemically or resin bonded, air laid chemically bonded, carded thermally bonded, airlaid  
10 thermally bonded, carded spunlaced or hydroentangled, wet laid chemically bonded, wet laid spunlaced or hydroentangled, meltblown, spunbond, apertured, needle punched, or any combinations thereof.

15           The wipe may also be smooth, textured, abrasive or any combinations thereof to aid in the ease of use by the end-user. In addition, it may be a three-dimensional, macroscopically-expanded, fluid pervious web.

20           The wipe may be provided or placed into the container in any fashion or method known to those skilled in the art. By way of example, the wipe may have a C-fold, a half fold, a Z-fold, a modified Z-fold, perforated in a roll, perforated and folded in a stack, interleaved, cross folded,  
25 quarter folded, or any combinations thereof.

One preferred form of the present invention has a composition with at least one preservative present in an amount effective to prevent spoilage and growth of inadvertently added microorganisms.

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Acceptable preservative, or preservative systems include, but are not limited to, organic sulfur compound, halogenated compound, cyclic organic nitrogen compound, low molecular weight aldehyde, quaternary compound, phenyl and phenoxy compound, paraben, organic acid and its derivatives, iodophor, quaternary ammonium compound, urea derivative, isothiazoline, alkyl substituted amino acid, formaldehyde, formaldehyde donors including 1-(3-chloroallyl)-3,5,7-azoniaadamantane chloride sold by Dow Chemical Company under the trade name DOWICIL 75, 1,3-bis(hydroxymethyl)-5,5-dimethylhydantoin, 1-(hydroxymethyl)-5,5-dimethyl hydantoin, 3-iodo-2-propynyl butyl carbamate, the combination of the preceding three being sold by Lonza under the trade name PANTOGARD PLUS LIQUID, hexahydro-1,3,5-tris(2-hydroxyethyl)-s-triazine sold under the trade name SURCIDE-P, or any combinations thereof. More preferably, the present system has one or more formaldehyde donors. The most preferred preservative system is 1-(3-chloroallyl)-3,5,7-azoniaadamantane chloride.

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When a preservative or preservative system is present, it is present in an amount about 0.001 weight percent (wt.%) to about 2 wt.% based on the total weight of the composition. The preservative or preservative system is more preferably present in an amount about 0.01 wt.% to about 1.0 wt.%, and most preferably present in an amount about 0.05 wt.% to about 0.15 wt.%, based on the total weight of the composition.

As stated above, a surfactant is used in the cleaning composition of the present invention. The surfactant or surfactant system has one or more surfactants. These surfactants are preferably mild surfactants. Such surfactants may be anionic, cationic, nonionic, zwitterionic, amphoteric surfactants, or any combinations thereof. Other suitable surfactants include, for example, amine oxide, fluorosurfactant, anionic fluorosurfactant, or any combinations thereof. The preferred surfactant system of the present invention has an anionic surfactant and a nonionic surfactant.

Suitable anionic surfactants include, but are not limited to, alcohol sulfate and sulfonate, alcohol phosphate and phosphonate, alkyl sulfate and sulfonate, alkylaryl sulfate and sulfonate, alkali metal or ammonium salt of

fatty acid, sulfonated amine, sulfonated amide, fatty  
sarcosinate, linear alkylated sulfonate, alcohol ether  
sulfate, secondary alkane sulfonate, or any combinations  
thereof. The most preferred anionic surfactants for use in  
5 the present invention are sodium octyl sulfate, sodium  
caprylyl sulfonate, or any combination thereof.

Suitable nonionic surfactants that can be used in the  
cleaning composition of the present invention include, but  
10 are not limited to, ethoxylated (EO), propoxylated (PO), and  
inter-dispersed ethoxylated-propoxylated (EO-PO): alcohol,  
copolymer, fatty acid, alkyl phenol, polyglycoside, n-  
alkylpyrrolidone, block copolymer, or any combinations  
thereof. The most preferred nonionic surfactants are EO,  
15 PO, and EO-PO alkyl phenol, or any combinations thereof.

Suitable amphoteric surfactants include, but are not  
limited to, one or more betaines, specifically  
cocamidopropyl betaine, and amine oxide including fatty  
20 amine oxide such as lauramine oxide. Other amine oxides  
include alkyl EO, PO and EO-PO amine oxide, C<sub>12</sub>-C<sub>15</sub> diethanol  
amine oxide, or any combinations thereof.

The surfactant or surfactant system, when present in  
25 the cleaning composition, is present in an amount about 0.1

wt.% to about 20 wt.% of the total weight of the composition weight. More preferably, the surfactant system is present in an amount about 0.5 wt.% to about 5 wt.%. Most preferably, the surfactant system is present in an amount  
5 about 1 wt. % to about 2 wt.% of the total weight of the cleaning composition.

In a preferred embodiment, the cleaning composition of the present invention has a carrier or vehicle, compatible  
10 with the preservative system, surfactant system and enhancing agent. The carrier may be water, one or more organic solvents, or any combination thereof.

Suitable organic solvents include, but are not limited  
15 to, alcohol, halogenated hydrocarbon, hydrocarbon, glycol, ethylene glycol, glycol ether, propylene glycol, propylene glycol methyl ether, dipropylene glycol, dipropylene glycol methyl ether, tripropylene glycol, tripropylene glycol methyl ether, methanol, ethanol, propanol, isopropanol,  
20 hexylcellosolve, butylcellosolve, methylcellosolve, aromatic hydrocarbon, ester, glycol ether ester, ketone, plasticizer, or any combinations thereof.

The preferred carrier is water. Preferably, the water  
25 is present in an amount that allows for the remainder of the

components to be at their appropriate concentrations (Q.S.,  
*quantum sufficit*).

Preferably, the cleaning composition of the present  
5 invention also includes one or more enhancing agents. These  
enhancing agents improve the stability, efficacy, ease, and  
pleasure of use by the end user. The enhancing agents that  
can be used in the present cleaning compositions include,  
but are not limited to, fragrance, malodor reducing  
10 ingredient or system, skin softening and conditioning agent,  
salt, pH control agent, peroxygen component, alcohol, soil  
resist, and combinations thereof.

Suitable fragrance for use in the present composition  
15 includes, but is not limited to, aromatic or an aliphatic  
ester having a molecular weight from about 130 to about 250;  
an aliphatic or an aromatic alcohol having a molecular  
weight from about 90 to about 240; an aliphatic ketone  
having a molecular weight from about 150 to about 260; an  
20 aromatic ketone having a molecular weight from about 150 to  
about 270; an aromatic or an aliphatic lactone having a  
molecular a weight from about 130 to about 290; an aliphatic  
aldehyde having a molecular weight from about 140 to about  
200; an aromatic aldehyde having a molecular weight from  
25 about 90 to about 230; an aliphatic or an aromatic ether

having a molecular weight from about 150 to about 270; or  
condensation product of aldehyde and amine having a  
molecular weight from about 180 to about 320.

5        When present, fragrance is preferably present in an  
amount about 0.001 wt.% to about 5 wt.%. More preferably,  
the fragrance is present in an amount about 0.05 wt.% to  
about 3 wt.%. The most preferred amount of fragrance is  
about 0.1 wt.% to about 0.3 wt.% of the total weight of the  
10       composition.

One or more malodor reducing agents or systems can also  
be used in the present invention. Malodor reducing agents  
that can be used in the present composition include, but are  
15       not limited to, cyclodextrin, inorganic acid, organic acid,  
metallic salt of inorganic and organic acid, enzyme or  
enzyme system, metazene, or any combinations thereof.

When present, the malodor reducing system is preferably  
20       present in an amount about 0.01 wt.% to about 10 wt.% by  
total weight of the composition. More preferably, the  
malodor reducing system is present in an amount about 0.05  
wt.% to about 3 wt.%, and most preferably about 0.1 wt.% to  
about 2 wt.%, of the total weight of the composition.

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One or more peroxygen compounds can be used in the present invention to aid in stain removal and efficacy of cleaning. Suitable peroxygen compounds include, but are not limited to, hydrogen peroxide, t-butyl hydroperoxide, sodium  
5 or other salts of percarbonate, sodium or other salts of perborate, or any combinations thereof. The preferred peroxygen compound is a high purity hydrogen peroxide.

When present, the peroxygen compound is preferably  
10 present in an amount about 0.2 wt.% to about 6 wt.% of the total weight of the composition. More preferably, the peroxygen compound is present in an amount about 1 wt.% to about 4 wt.%, and most preferably about 2.5 wt.% to about  
15 3.5 wt.%, of the total weight of the composition.

As stated above, softening agents and skin conditioners can be used in the present invention. Suitable softening agents and skin conditioners that can be used in the present composition include, but are not limited to, quaternary  
20 ammonium chloride salt, silicone based conditioning system, imidazoline, lanolin and lanolin derivative, polyol, botanical derivative, vitamin, vitamin complex, or any combinations thereof.

When present, softening agents and skin conditioners are preferably present in an amount about 0.001 wt.% to about 5 wt.% of the total weight of the composition. More preferably, softening agents and skin conditioners are present in an amount about 0.05 wt.% to about 5 wt.%, and most preferably about 0.1 wt.% to about 1 wt.%, based on the total weight of the composition.

A pH control agent or system is useful in the present invention to maintain stability and ease of use. Suitable pH control agents include, but are not limited to, inorganic acid, inorganic base, salt of inorganic acid, organic acid, organic base, salt of organic acid, phosphorous compound including 1-hydroxyethylidene-1,1-diphosphonic acid sold under the trade name DEQUEST 2010 by Monsanto Co., or any combinations thereof. Preferred suitable pH control agents include, but are not limited to, 1-hydroxyethylidene-1,1-diphosphonic acid, sodium bicarbonate, sodium sulfate, sodium phosphate, sodium carbonate, citric acid, sodium citrate, or any combinations thereof. The pH control agent is incorporated in the present invention in an amount that produces the desired pH range.

The pH range of the cleaning composition is about 4 to about 12. The more preferred pH range is about 7.5 to about

10.5, with the most preferred range being about 8 to about  
9.5. It has been found that controlling and maintaining the  
pH of the composition in the wipe contributes to the  
exceptional stability and microbial growth prevention of the  
5 present invention.

The cleaning composition of the present invention may  
also have one or more alcohols. Alcohol provides improved  
cleaning of certain types of stains over the non-alcohol  
10 containing prior art. The alcohol may act as a  
preservative, and improve composition wicking in the wipe  
material. This improvement in wicking may obviate the need  
to invert the wipe package during the manufacturing process  
prior to storage, or by the end user prior to use.

15 When present, the alcohol in the cleaning composition  
of the present invention may exhibit a preservative  
functionality. In addition, it has been unexpectedly found  
that the inclusion of alcohol in the present invention  
20 synergistically improves the storage stability of the  
impregnated cleaning wipe. The synergy discovered is  
believed to be due to the alcohol providing for mobility of  
the above-mentioned preservative in the present invention  
throughout the entire wipe matrix. This is especially  
25 important to prevent the top portion of the wipe from going



dry, which would make it even more prone to microbial growth upon storage.

Suitable alcohols for use in the present invention include, but are not limited to, methanol, ethanol, propanol, isopropanol, n-butanol, sec-butanol, tert-butanol, or any combinations thereof. Ethanol is the preferred alcohol for use in a preferred embodiment of the present invention.

The alcohol in the present composition may be present in an amount about 1 wt.% to about 20 wt.% of the total weight of the composition. The alcohol is present more preferably in an amount about 5 wt.% to about 10 wt.%, and most preferably in an amount about 6 wt.% to about 8 wt.%, based on the total weight of the composition.

The cleaning composition of the present invention may also include a soil resist. The soil resist may be, for example, polymeric or copolymeric. Suitable polymeric or copolymeric soil resists include, but are not limited to, polymer derived from styrene-maleic anhydride copolymer resin, monomer of acrylic acid, methacrylic acid, methacrylate, methylmethacrylate, ethyl acrylate, maleic acid, and any copolymer derived from the above monomer.

Still others may include, for example, polyvinylpyrrolidone, polyacrylate, modified cellulose polymer, polycarboxylate, vinyl acetate/maleic anhydride copolymer resin, cationic amine, aliphatic quaternary ammonium salts known to have  
5 anti-static properties, imidazoline salts, fluoroaliphatic oligomer or polymer, fluorinated hydrocarbon soil resist such as the ZONYL series from DuPont, fluorinated acrylate copolymer, or any combinations thereof.

10 Preferably, the polymeric or copolymeric soil resist is a mixture of acrylate polymers having a wide range of molecular weights. The preferred polymeric or copolymeric soil resist is a water-based carboxylated acrylic copolymer sold by Interpolymer Corporation under the trade name  
15 SYNTRAN DX6-125. The SYNTRAN DX6-125 soil resist is a water-based dispersion containing about 20 wt.% of a copolymer of methacrylic acid, methylmethacrylate and styrene, having a number average molecular weight about 6000 to about 8000. This dispersion has a specific gravity of  
20 about 1.055, a pH at 22°C of about 8, and a viscosity at 22°C of about 1000 cps (Brookfield) maximum. Most preferably, the soil resist is the fluorinated hydrocarbon soil resist of the type sold under the trade name ZONYL 7950 by DuPont.

When present, the soil resist is in the cleaning composition in an amount about 0.01 wt.% to about 4 wt.% of the total weight of the cleaning composition. More preferably, the soil resist is about 0.05 wt.% to about 0.5 wt.%. Most preferably, the soil resist is about 0.06 wt.% to about 0.15 wt.% of the total weight of the cleaning composition.

10 The cleaning composition loading level is defined herein as the ratio of the weight of cleaning composition to the weight of the wipe. The loading level is about 1:1 to about 10:1 respectively. More preferably, the cleaning composition loading level is about 2:1 to about 6:1, with the most preferred loading level being about 3:1 to about 15 4.5:1.

In use, the cleaning wipe impregnated with the cleaning composition according to the present invention would preferably be used on clothes, carpets, or other inanimate 20 objects. The stain or area to be cleaned is wiped repeatedly with at least one of the impregnated wipes of the present invention, refolding the wipe as necessary until the desired degree of cleaning is achieved.

It is to be understood that although the cleaning wipe described herein has been generally discussed in conjunction with the cleaning of carpets, clothes and other inanimate objects, nonetheless, the present invention may be utilized  
5 in the cleaning of a wide variety of substrates including but not limited to those mentioned above.

The cleaning composition may be impregnated on the wipe of the present invention by any process known in the art.  
10 Such processes include spraying of the wipe, complete or partial dipping of the wipe, pre-filling a suitable container with cleaning solution prior to addition of the wipe, top filling the cleaning composition over the wipe material contained within a suitable container, submersing  
15 the wipe in the container, or any combinations thereof.

The superior wicking properties of the cleaning composition described previously in a preferred embodiment of the present invention, i.e., an alcohol containing  
20 cleaning composition, may, however, make inverting the wipe and cleaning composition package unnecessary.

One preferred cleaning composition of the present invention will have about 1 wt.% to about 20 wt.% alcohol,  
25 about 0.1 wt.% to about 20 wt.% surfactant, about 0.001 wt.%

to about 2 wt.% preservative, about 0.01 wt.% to about 4 wt.% soil resist, and an aqueous carrier q.s. to 100 wt.%. The composition has a pH about 4 to about 12.

5 A more preferred cleaning composition of the present invention will have about 5 wt.% to about 10 wt.% alcohol, about 0.5 wt.% to about 5 wt.% surfactant, about 0.01 wt.% to about 1 wt.% preservative, about 0.05 wt.% to about 0.5 wt.% soil resist, and an aqueous carrier q.s. to 100 wt.%,  
10 with a pH about 7.5 to about 10.5.

A most preferred cleaning composition of the present invention will have about 6 wt.% to about 8 wt.% alcohol, about 1 wt.% to about 2 wt.% surfactant, about 0.05 wt.% to  
15 about 0.15 wt.% preservative, about 0.06 wt.% to about 0.15 wt.% soil resist, and an aqueous carrier q.s. to 100 wt.%, with a pH about 8 to about 9.5.

A cleaning wipe of the present invention was formed  
20 with the following ingredients in amounts expressed as percent by weight of the total weight of the cleaning composition.

Option 1 Cleaning Composition

## Non-Alcohol Cleaning Wipe

	Ingredients	Type of Ingredient	Wt. % Active
5	Water	Carrier	97.4
	Sodium Octyl Sulfate/ Sodium Caprylyl Sulfonate/ Octoxynol-9	Surfactant	1.6
10	Anionic Fluorosurfactant	Soil resist	0.1
	Sodium Bicarbonate	Enhancing agent	0.5
	1-(3-chloroallyl) -3,5,7-azoniaadamantane chloride	Preservative	0.1
15	Fragrance	Fragrance	0.3

Option 2 Cleaning Composition

## Alcohol Containing Cleaning Wipe

	Ingredients	Type of Ingredient	Wt. % Active
20	Water	Carrier	91.1
	Sodium Octyl Sulfate/ Sodium Caprylyl Sulfonate/ Octoxynol-9	Surfactant	1.4
25	Anionic Fluorosurfactant	Soil resist	0.1
	Ethanol	Alcohol	6.5
	Sodium Bicarbonate	Enhancing agent	0.5
30	1-(3-chloroallyl) -3,5,7-azoniaadamantane chloride	Preservative	0.1
	Fragrance	Fragrance	0.3

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Wipe A

	Amount	Description
40	4:1	Loading ratio (by weight) of cleaning composition to wipe roll
	40	Wipes per roll
	5.75" x 7.5"	Wipe dimensions
	40g	Composite bulk fabric
	22.5-27.5%	Rayon Fiber
45	22.5-27.5%	Polyester Fiber
	45-55%	Wood pulp fiber
	20-24%	Binder

Wipe B

Amount	Description
3.5:1	Loading ratio (by weight) of cleaning composition to wipe roll
30	Wipes per roll
5.75" x 10.0"	Wipe dimensions
40g	Composite bulk fabric
22.5-27.5%	Rayon Fiber
22.5-27.5%	Polyester Fiber
45-55%	Wood pulp fiber
20-24%	Binder

The following examples of stain removal performance illustrate the effectiveness of the present invention when used to remove stains from fabrics and carpets.

EXAMPLE 1(A): Product Efficacy Testing and Comparison

Testing was performed in the laboratory to demonstrate the ability of the compositions of the present invention in removing common stains typically found on rugs and carpets. Cut pile 100% nylon carpet swatches (4" x 4") in dimension were used for test purposes. Liquid and semi-viscous liquids were uniformly applied consistent with standard laboratory practice. The cleaning procedure was initiated after a two-hour dwell period. The test procedure used was as follows:

1. The stain was blotted repeatedly using white paper towels until no transfer occurred.

2. Seven grams of the non-wipe cleaning agents (Woolite® Spot and Stain and Resolve® Liquid) were applied to the stain and allowed to sit for a period of approximately one minute.

5

3. To rub the non-wipe cleaning agent into the stain, a damp colorfast sponge was used. The wipes of the present invention were used as prepared to rub the cleaning composition into the stain. Both the non-wipe cleaning agents and the wipe of the present invention were rubbed thirty times in a back and forth motion on the stain. For the non-wipe cleaner, the sponge was rinsed and used again to rub the cleaning agent into the stain an additional thirty times. The wipes of the present invention were used as prepared, but were re-folded to expose a clean area of the wipe prior to repeating the rubbing process an additional 30 times.

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4. Test material was allowed to dry at ambient temperature, then vacuumed using five forward and five reverse strokes with a commercial upright beater bar vacuum.

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5. An internal panel of twenty people assessed the appearance of the stain using the AATCC Gray Scale (see below).

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Gray Scale	Description
5	Negligible or no change
4	Slight change
3	Noticeable change
2	Considerable change
1	Severe change

The scale is used to compare a stain that has been cleaned against two controls, an unstained fabric, and a stained fabric. A rating of 5 indicates that the remnants of the stain are negligible or undetectable and a rating of 1 indicates a severe difference between the stain that has been cleaned against an unstained fabric.

Results of this study are set forth in Table 1(A).

Table 1(A): Alcohol and Non-Alcohol Wipe Efficacy

STAIN	OPTION 1 WIPE A 1 WIPE	OPTION 1 WIPE A 2 WIPES	OPTION 2 WIPE A 1 WIPE	OPTION 2 WIPE A 2 WIPES	Woolite® Spot & Stain	Resolve® Liquid
Grape Juice	3.9	3.8	4.0	3.6	3.7	3.9
Dirty Motor Oil	2.8	3.8	1.6	4.2	2.9	4.5
Red Wine	2.8	3.1	3.2	3.3	2.8	3.0
Cola	4.9	4.8	4.8	4.9	4.6	4.6
Spaghetti Sauce	4.9	4.7	4.7	4.9	4.8	4.7

Results of this cleaning study clearly indicate the effectiveness of this invention both with and without alcohol, in removing stains from carpet.

5 EXAMPLE 1(B): Alcohol Containing Product Efficacy Testing

For this example of cleaning performance, testing was performed by an independent testing laboratory to

10 demonstrate the ability of a preferred embodiment of the present invention, Option 2-Wipe B, to remove common stains typically found on rugs and carpets. Twelve stains were evaluated. Test material used was continuous filament, cut pile, beige color stainmaster treated carpet, 100% nylon.

15 Liquid and semi-viscous liquids were uniformly applied in a one inch diameter ring. The balances of the staining agents were applied as uniformly as possible consistent with standard laboratory practice. All stains were applied in duplicate. The cleaning procedure was initiated after a

20 one-hour dwell period. The cleaning procedure employed was as follows:

1. The stain was blotted with paper towels until no more stain could be absorbed.

25

2. A single wipe fabric was removed from its canister.

3. The wipe was folded into enough surface area to cover and clean the stained area.

4. The wipe was used to rub the stain 30 times in a back and forth motion. The wipe was then re-folded to get to a clean area of the wipe, and the rubbing process was repeated an additional 30 times.

5. The test material was allowed to dry at ambient temperature, and then vacuumed.

6. A panel of three technicians assessed the appearance of the stain using the AATCC Gray Scale (see above).

7. Staining agents not removed to a rating of 5 were cleaned a second time. (A new, fully wet wipe was removed from the product canister and steps 3 - 6 were repeated.)

Results of this study are shown in Table 1(B).

Table 1(B): Alcohol Wipe Efficacy

		OPTION 2 WIPE B 1 WIPE	OPTION 2 WIPE B 2 WIPES
5	Staining Agent		
	Grape Juice	3.0	4.5
	Lipstick (Cosmetic)	3.8	3.8
	Ketchup	5.0	----
10	Dog Urine	5.0	----
	Red Wine	2.6	4.0
	Foot Traffic Dirt	3.4	3.9
	Coffee		
	(milk/sugar)	2.5	3.5
15	Cola	4.3	5.0
	Spaghetti Sauce	4.2	4.4
	Chocolate Milk	2.6	3.3
	Baby Food -		
	Carrots	4.2	4.8
20	Mixed Vegetables	4.2	4.8

Results of this study clearly indicate the effectiveness of this invention at removing a host of tough, common stains typically found on rugs and carpets.

EXAMPLE 2: Product Consumer Testing

The performance and consumer response of cleaning wipe Option 1 Wipe A (without alcohol) and cleaning wipe Option 2 Wipe A (with alcohol) were evaluated as new products for removing spots and stains from carpets, fabric, and upholstery. Product testing employed 200 people who claimed to have cleaned spots and stains from their carpet and upholstery within the last 3 months. Two cells of 100

people each were set up. Each product was used for two weeks. The data is set forth in Table 2.

Table 2: Non-Alcohol and Alcohol Wipe Consumer Testing

Attribute	Option 2 Alcohol	Option 1 Non-Alcohol
Rating System*	Top Box/Top 2 Box	Top Box/Top 2 Box
<b>Cleaning</b>		
Cleans well overall	64/90	72/90
Effectively removes spots and stains	59/89	63/87
Removes old stains	25/46	30/53
Removes fresh spills	80/94	76/91
<b>Convenience</b>		
Is easy to use	82/95	76/90
Solves a problem for you	63/87	63/85
Is convenient to use	90/96	85/94
Is easy to handle	83/94	73/86
<b>Fragrance/Odors</b>		
Leaves carpet and/or upholstery smelling clean and fresh	64/88	72/92
Removes odors from carpet and/or upholstery	40/66	44/68
Has a pleasant scent	69/91	75/94
<b>Safety</b>		
Is safe for all carpets	80/96	72/91
Is safe to use around children and pets	83/96	76/90
Does not discolor carpet	91/98	89/99
<b>Miscellaneous</b>		
Does not leave a residue	80/96	80/93
Wipe fabric does not fall apart during use	87/96	76/92

- 5 \* Rating system indicates the number of respondents that chose either the top rating (Top Box) or the top rating plus the second to top rating (Top 2 Box).

Overall, each embodiment of the present invention was well received by the participants in this study. High acceptance ratings on almost all key attributes including cleaning, convenience, fragrance/odor and safety clearly demonstrate how well these products performed.

### 10 Example 3: Product Stability Testing

Summary of the Eight Week Preservative Challenge Screen for Cleaning Composition Impregnated on Wipe.

#### 15 A. Inoculum Preparation

Cultures were obtained from trypticase soy agar (TSA) slants (bacteria) and sabouraud dextrose agar (SDA) slants (mold and yeast). One loopful of each bacteria strain was transferred to trypticase soy broth and one loopful of yeast was transferred to sabouraud dextrose broth. Mold was transferred to SDA plates. The bacteria and yeast were incubated at 35°C for 18 to 24 hours. Mold was incubated at 25°C for approximately 7 days. After incubation, bacteria and yeast broth samples were centrifuged for 30 minutes at 3000 rpm. Mold spores were suspended in phosphate buffer saline and centrifuged for 30 minutes at 3000 rpm. After centrifuging, bacteria suspensions were made to yield about

1.0 x 10<sup>6</sup> to about 2.0 x 10<sup>6</sup> bacteria and about 1.0 x 10<sup>6</sup> to about 2.0x 10<sup>5</sup> mold per ml.

5 B. Test Organisms

P. aeruginosa	ATCC #9027
S. aureus	ATCC #6538
E. coli	ATCC #8738
10 C. albicans	ATCC #10231
A. niger	ATCC #16404

15 C. Product Preparation and Inoculation

One sample was inoculated for each test organism.

20 Evaluations included inoculation via 1 of 2 methods: top inoculation, whereby the top of each wipe roll was completely wetted with the appropriate amount of inoculum; or 5 spot inoculation, where each individual wipe was inoculated with 100 µl of inoculum at each corner, and at

25 the center of the wipe. The samples were stored at room temperature and re-inoculated at Day 28.

30 D. Recovery of Inoculated Organisms

Assay of the inoculated samples were done at the following time intervals after inoculation: Day 7, 14, 21, 28, 35, 42, 49, and 56. Samples were re-inoculated after plating on day 28.

## Assay Procedure

Using sterile forceps, three wipes were aseptically removed from the center of each roll and placed into 100 ml  
5 Letheen broth bottles. The bottles were then placed on an orbital shaker for 30 minutes at 250 rpm. After shaking, 1 ml of each sample was pipetted into a separate petri dish. 15-20 ml of TSA were poured into each plate for bacterial challenged samples and 15-20 ml of SDA into each plate for  
10 yeast and mold challenged samples. The plates were swirled and then allowed to solidify. The bacteria plates were then incubated at 30°C for 3 days. The mold and yeast plates were incubated at 25°C for at least 5 days. After the appropriate incubation time, a colony count was made.

## E. Interpretation of Results

Effective preservative systems are determined as  
20 follows:

Bacteria: A 3 log reduction (99.9%) by day 7 after each inoculation (day-7 and day-35) and no increase at any time during the 8 week test period.

25 Fungi: A 2 log reduction (99%) by day 7 after each inoculation (day-7 and day-35) and no increase during the 8 week test period.



Results are in Table 3.

Table 3

Sample #		Results*		
	Description	Day	Bacteria	Fungi
5	1) Non-Preserved Non-Alcohol Non-Inverted	21	-----	NE
10	2) Preserved Non-Alcohol Non-Inverted	21	-----	NE
15	3) Non-Preserved Alcohol Non-Inverted	21	-----	NE
	4)** Option 1 Wipe A Preserved Non-Alcohol Inverted	56	E	E
20	5) Option 2 Wipe A Preserved Alcohol Non-Inverted	56	E	E
25	6) Option 2 Wipe B Preserved Alcohol Non-Inverted	56	E	E
30				
*E - Effective; NE - Non-Effective				
** 5 spot inoculation				

35 In comparing the above samples, the absence of product  
inversion, either with or without alcohol and with or  
without a preservative (Samples 1, 2 and 3 respectively)  
yields a non-acceptable product due to mold growth.  
However, as samples 4, 5 and 6 demonstrate, inversion with a  
40 preservative but without alcohol or non-inversion with a

preservative and with alcohol, produce an acceptable product in terms of an effective preservative.

5 This data also demonstrates the superior wicking capability of the alcohol containing form of the present invention and the synergy between the alcohol and preservative system.

10 The present invention has been described with particular reference to the preferred forms thereof. It will be obvious to one of ordinary skill in the art that changes and modifications may be made therein without departing from the spirit and scope of the present invention as defined by the following claims.

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